

## A CONTRIBUTION TO NEW RECORDS OF IRANIAN BUPRESTIDAE (COLEOPTERA)

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**ABSTRACT:** A total of 10 species in 5 genera were collected from different regions of Iran and represent new country records. In addition to the host trees of the beetle species, the synonymy and extra-Iranian distributional data are given in the paper.

**KEY WORDS:** Buprestidae, fauna, host plant, new records, Iran.

### INTRODUCTION

Forests form an integral part of life on earth, providing a range of benefits at local, national and global levels, covering approximately 40% of the world's total land mass (FAO 1995). Forest ecosystems are distinct, coherent communities comprised of a variety of life forms and a physical environment with which they interact (Slocombe, 1993). Integral to this concept is that the system should have sufficient diversity and complexity and an inherent capacity to be self-sustaining in the absence of catastrophic disturbances. A sustainable ecosystem has the capacity across the landscape for renewal, for recovery from a wide range of disturbances, and for retention of its ecological resiliency, while meeting the current and future needs of people for desired levels of values, uses, products and services (Werner, 1996). Biotic and abiotic forest disturbances, such as outbreaks of native insects are natural influences in forest ecosystems. Many forest insects play important roles in forest succession by selectively killing or retarding the growth of certain tree species while leaving others untouched (Castello et al., 1995).

One of the important pests groups in forest trees of almost all regions are the jewel beetles or metallic wood-boring beetles (Coleoptera: Buprestidae) (Bilý, 2003). The family Buprestidae is among the largest of the beetle families, with nearly 15,000 species known in 511 genera. As the latter common names suggest, these insects are wood-boring as larvae, with the immature forms slowly tunnelling through a variety of woody tissues of many tree and shrub species. However, a large percentage of the family is instead stem- or leaf-mining, many having

been erroneously combined taxonomically due to misperceptions about convergent adult morphologies. From studies of larvae, pupae and host associations, it is becoming clear that leaf-mining may be a derived strategy that has evolved independently at or near the apex of several widely separated buprestid lineages (Bellamy, 2002; Sakalian, 2003). The wood-boring types generally favor dying or dead branches on otherwise healthy trees, while a few types attack green wood; some of these are serious pests capable of killing trees and causing major economic damage (Bílý, 1999; Bellamy, 2006). Two of the largest genera, *Agrilus* Curtis, 1825 (one of the largest genera in the world with nearly 3,000 described spp.) and *Chrysobothris* Eschscholtz, 1829 are cosmopolitan; two others, *Anthaxia* Eschscholtz, 1829 and *Acmaeodera* Eschscholtz, 1829 found on all continents except Australia; *Sphenoptera* Dejean, 1833 with more than 1,000 species found only in the Palaeartic, Afrotropical and Oriental regions (Bellamy, 1985; Niehuis & Tezcan, 1993).

The fauna of Iranian Buprestidae was previously well studied, e.g. 216 species were listed in the checklist of Modarres Awal (1997); but Iran includes diverse forest habitats with a proportional diversity of tree and shrub flora and therefore hosts diverse forest pests. The research that was conducted and has yielded this paper was necessary prior to completing a faunal survey of the entire Iranian Buprestidae.

## MATERIALS AND METHODS

The materials were collected from different provinces of Iran through 1998 - 2000. For collecting the specimens, plant parts, stems, branches and shoots infested with xylophagous species were picked and placed in plastic bags once a month. Samples were taken to the laboratory in an ice chest, then transferred to a cage consisting of a wooden frame (40 x 30 x 55 cm), covered with insect-proof gauze and held at  $25 \pm 2$  °C and  $65 \pm 5$  %RH. Thus, immature insects in the wood tissue were allowed to reach the adult stage and emerged into the respective cages. Monthly observations were made to determine the numbers of adult insects from each collection site and date. In addition to rearing of many specimens, the preserved specimens in the collections of Ghamshahr, Shahr-e-Rey and Tehran Islamic Azad universities were studied.

In addition to the checklist of Modarres Awal (1997), the current taxonomy was checked against the recent *Catalogue of Palaeartic Coleoptera* (e.g. Bílý, 2006; Jendek, 2006; Kubán, 2006; Volkovitsh, 2006; Volkovitsh & Kalashian, 2006) to verify all Palaeartic species that have been previously recorded to occur in Iran.

## SPECIES LIST

A total of 10 species in 5 genera including, *Acmaeodera* (2 species), *Acmaeoderella* (2 species), *Agrilus* (1 species), *Anthaxia* (4 species), and *Sphenoptera* (1 species) have been identified as the new records for the

Iranian fauna. The species list with synonymy, extra-Iranian distributional data, and host plants is below.

***Acmaeodera babatauensis* Obenberger, 1935**

synonyms: *Acmaeodera babatauensis* Obenberger, 1935: 207.

*Acmaeodera gussakovskii* Stepanov, 1958: 114.

Specimens examined: Semnan province: Semnan; April 2000 (2 specimens) on almond, *Amygdalus communis* L. (Rosaceae).

Distribution: Kirghizia, Tadjhikistan, Turkmenistan, Uzbekistan.

***Acmaeodera quadrizonata* Abeille de Perrin, 1891**

synonyms: *Acmaeodera quadrizonata* Abeille de Perrin, 1891: 269.

Specimens examined: West Azerbaijan province: Maco; July 2000 (2 specimens) on cherry, *Cerasus avium* (L.) (Rosaceae).

Distribution: Bulgaria, Cyprus, Greece, Israel, Jordan, Lebanon, Macedonia, Syria, Turkey.

***Acmaeoderella glasunovi* (Semenov-Tian-Shanskij, 1895)**

synonyms: *Acmaeoderella glasunovi* (Semenov-Tian-Shanskij), 1895a: 265 (*Acmaeodera*).

*Acmaeodera judinae* Stepanov, 1954: 1307.

*Acmaeodera varsobica* Stepanov, 1958: 112.

Specimens examined: Golestan province: National Park; May 2000 (1 specimen) on juniper, *Juniperus communis* (Cupressaceae).

Distribution: Kazakhstan, Kirghizia, Tadjhikistan, Turkmenistan, Uzbekistan.

***Acmaeoderella turanica* (Reitter, 1890)**

synonyms: *Acmaeoderella turanica* (Reitter), 1890: 340 (*Acmaeodera*, variety of *casgica*).

*Acmaeodera sogdiana* Semenov-Tian-Shanskij, 1895b: 264.

*Acmaeodera diminuta* Semenov-Tian-Shanskij, 1895b: 265 (variety of *sogdiana*).

*Acmaeodera warentzoffi* Théry, 1895b: clviii.

Specimens examined: Kerman province: Kerman; September 2000 (1 specimen) on *Acacia armata* (Leguminosae).

Distribution: Afghanistan, Kazakhstan, Tadjhikistan, Turkmenistan, Uzbekistan.

***Agrilus pecirkai* Obenberger, 1916**

synonyms: *Agrilus pecirkai* Obenberger, 1916: 273.

Specimens examined: Khorasan province: Torbat-Jam; August 1999 (3 specimens) on oak, *Quercus rotundifolia* (Fagaceae).

Distribution: Kirghizia, Tadjhikistan, Turkmenistan, Uzbekistan.

***Anthaxia (Cratomerus) iliensis* Obenberger, 1914**

synonyms: *Anthaxia iliensis* Obenberger, 1914: 115.

Specimens examined: Mazandaran province: Savadkooh; June 2000 (1 specimen) on elm, *Ulmus campestris* (Ulmaceae).

Distribution: China: Northwest Territory, Kazakhstan, Kirghizia, Uzbekistan.

***Anthaxia (Haplantaxia) olympica* Kiesenwetter, 1880**

synonyms: *Anthaxia olympica* Kiesenwetter, *in* Kiesenwetter & Kirsch 1880: 131.

*Anthaxia smyrnensis* Obenberger 1924f: 27.

Specimens examined: East Azerbaijan province: Arasbaran; July 2000 (3 specimens) on Tree of Chastity, *Ailanthus altissima* (Mill.).

Distribution: Albania, Armenia, Austria, Belorussia, Bosnia-Herzegovina, Bulgaria, Croatia, Czechia, Georgia, Greece, Hungary, Israel, Macedonia, Moldavia, Romania, Russia: South European Territory, Slovakia, Slovenia, Syria, Turkey, Ukraine, Yugoslavia.

***Anthaxia (Haplantaxia) umbellatarum* (Fabricius, 1787)**

synonyms: *Anthaxia umbellatarum* (Fabricius), 1787: 183 (*Buprestis*).

*Anthaxia inculta* (Germar), 1817: 217 (*Buprestis*).

*Anthaxia aerea* Rey, 1891: 4 (variety of *inculta*).

Specimens examined: West Azerbaijan province: Mahabad; July 1999 (2 specimens) on fig tree, *Ficus carica* (Moraceae).

Distribution: Albania, Algeria, Armenia, Belorussia, Bosnia-Herzegovina, Bulgaria, Croatia, France, Germany, Greece, Crete, Hungary, Iraq, Italy Libya, Malta, Macedonia, Moldavia, Montenegro, Morocco, Portugal, Romania, Russia: South European Territory, Slovenia, Spain, Switzerland, Syria, Tunisia, Turkey, Ukraine, Yugoslavia.

***Anthaxia (Melantaxia) conradti* Semenov-Tian-Shanskij, 1891**

synonyms: *Anthaxia conradti* Semenov-Tian-Shanskij, 1891: 335.

*Anthaxia strangulata* Abeille de Perrin, 1900: 9.

*Anthaxia bucharica* Obenberger, 1913e: 66.

*Anthaxia musartensis* Obenberger, 1938d: 229 (variety of *canifrons*).

*Anthaxia thoracangula* Obenberger, 1938d: 229 (variety of *canifrons*).

*Anthaxia namanganensis* Obenberger, 1938d: 229 (variety of *canifrons*).

*Anthaxia semirjetshica* Obenberger, 1938d: 230 (variety of *canifrons*).

*Anthaxia issykkulensis* Obenberger, 1938d: 230 (variety of *canifrons*).

*Anthaxia ferghanensis* Obenberger, 1938d: 230 (variety of *canifrons*).

*Anthaxia tadjika* Obenberger, 1938d: 230 (variety of *canifrons*).

*Anthaxia euthorax* Obenberger, 1938d: 230 (variety of *canifrons*).

Specimens examined: Khorasan province: Birjand; September 2000 (1 specimen) on pear, *Pyrus boissieriana* (Rosaceae).

Distribution: China: Xizang, Kazakhstan, Kirghizia, Tadzhikistan, Turkmenistan.

***Sphenoptera (s. str.) lia* Jakovlev, 1901**

synonyms: *Sphenoptera lia* Jakovlev, 1901: 168.

Specimens examined: Golestan province: National Park; August 2004 (2 specimens) on mountain almond, *Amygdalis scoparia* Spash (Rosaceae).

Distribution: Turkmenistan, Uzbekistan.

**DISCUSSION**

In the present research, 10 species of Buprestidae are new species records for Iran. Since the list of Iranian Buprestidae included 216 species (Modarres Awal, 1997) and another 13 species added from the recent *Catalogue of Palearctic Coleoptera* (e.g. Bílý, 2006; Jendek, 2006; Kubán, 2006; Volkovitsh, 2006; Volkovitsh & Kalashian, 2006), therefore the total number of species is 239. Iran is a large country incorporating various geographical regions and climates and we expect that a large number of species remain to be discovered. To find new species and distributional records, more studies should be conducted on this important insect group in Iran.

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### LITERATURE CITED

**Abeille de Perrin, E.** 1891. Contributions aux Buprestides paléarctiques (Coleoptera). Revue d'Entomologie, 10: 257-288.

**Abeille de Perrin, E.** 1900. Diagnoses de Coléoptères présumés nouveaux. Bulletin de l'Académie de Marseille, 27: 1-23.

**Bellamy, C. L.** 1985. A catalogue of the higher taxa of the family Buprestidae (Coleoptera). Navorsing van die Nasionale Museum, Bloemfontein, 4 (15): 405-472.

**Bellamy, C. L.** 2002. Coleoptera: Buprestoidea. In: Houston, K. W. W. (Ed.). Zoological Catalogue of Australia, Volume 29.5. Melbourne: CSIRO Publishing, Australia, xii + 492 pp.

**Bellamy, C. L.** 2006. Insecta Coleoptera Buprestidae de Madagascar et des îles voisines, catalogue annoté. [Insecta Coleoptera Buprestidae of Madagascar and adjacent islands, an annotated catalogue]. Faune de Madagascar, 263 pp.

**Bilý, S.** 1999. Larvae of Buprestid beetles: (Coleoptera: Buprestidae) of Central Europe. Acta Ent. Musei Nat. Pragae, Supplementum 9, pp. 1-45 + 33 tables.

**Bilý, S.** 2003. Summary of the bionomy of the buprestid beetles of Central Europe (Coleoptera: Buprestidae). Acta Entomologica Musei Nationalis Pragae, Supplementum 10, 104 pp, 16 color plates.

**Bilý, S.** 2006. New nomenclatorial and taxonomic acts, and comments. Buprestidae: Anthaxiini. pp. 58-60. Catalogue. Buprestidae: Chrysochroinae: Paratassini. p. 350; Buprestinae: Anthaxiini. pp. 369-381. In: I. Löbl & A. Smetana (Eds): Catalogue of Palaearctic Coleoptera. Volume 3. Scarabaeoidea - Scirtoidea - Dascilloidea - Buprestoidea - Byrrhoidea. Apollo Books, Stenstrup, 690 pp.

**Castello, J. D., Leopold, D. J. & Smallidge, P. J.** 1995. Pathogens, patterns, and processes in forest ecosystems. BioScience, 45 (1): 16-24.

**Fabricius, J. C.** 1787. Mantissa insectorum sistens eorum species nuper detectas adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus, Volume 1, 348 pp; Volume 2, C. G. Proft, Hafniae, 382 pp.

**FAO.** 1995. The challenge of sustainable forest management: what future for world's forests. FAO, Rome, 128 pp.

**Germar, E. F.** 1817. Reise nach Dalmatien und in das Gebiet von Ragusa. Bd. 2. Brockhaus, Leipzig, 323 pp., 9 plates.

**Jakovlev, B. E.** 1901. Étude sur les espèces du genre Sphenoptera Sol. (Coleoptera, Buprestidae). V. Horae Societatis Entomologicae Rossicae, 35: 168-184.

**Jendek, E.** 2006. New nomenclatorial and taxonomic acts, and comments. Buprestidae: Agrilus. p. 60. Catalogue. Buprestidae: Agrilinae: Agrilini: Agrilina: Agrilus. pp. 388-403. In: I. Löbl & A. Smetana (Eds): Catalogue of Palaearctic Coleoptera. Volume 3. Scarabaeoidea - Scirtoidea - Dascilloidea - Buprestoidea - Byrrhoidea. Apollo Books, Stenstrup, 690 pp.

- Kiesenwetter, E. A. H. von. & Kirsch, T.** 1880. Neue Anthaxia-Arten. Entomologische Monatsblätter, 19: 129-133.
- Kubán, V.** 2006. New nomenclatorial and taxonomic acts, and comments. Buprestidae: various groups. pp. 40-52. Catalogue. Buprestidae: Chrysochroinae: Chrysochroini, Chalcophorini, Dicerini, Poecilnotini. pp. 342-352. Buprestinae: Actenodini. p. 369; Buprestini, Chrysobothrini, Coomaniellini, Kisanthobiini, Melanophilini, Thomassetiini. pp. 381-388; Agrilinae: Agrilini: (without genus Agrilus), Aphanisticini (& M. Y. Kalashian), Coraebini, Trachysini. pp. 403-421. In: I. Löbl & A. Smetana (Eds): Catalogue of Palaearctic Coleoptera. Volume 3. Scarabaeoidea - Scirtoidea - Dascilloidea - Buprestoidea - Byrrhoidea. Apollo Books, Stenstrup, 690 pp.
- Modarres Awal, M.** 1997. Buprestidae (Coleoptera), pp. 131-140. In: Modarres Awal, M. (Ed.) List of agricultural pests and their natural enemies in Iran. Ferdowsi University Press, 428 pp.
- Niehuis, M. & Tezcan, S.** 1993. Beitrag zur Kenntnis der Agrilus-Arten der Türkei (Coleoptera: Buprestidae). Mitteilungen des Internationalen Entomologischen Vereins, 18: 1-74.
- Obenberger, J.** 1913. Vorläufige Diagnosen einiger neuen Anthaxien (Buprestidae). Coleopterologische Rundschau, 2: 62-69.
- Obenberger, J.** 1914. Neue Anthaxiaarten (Col. Buprest.) aus den Sammlungen des Wiener Hofmuseums. Wiener Entomologische Zeitung, 33: 113-116.
- Obenberger, J.** 1916. Studien über paläarktische Buprestiden. I. Teil. Wiener Entomologische Zeitung, 35: 235-278.
- Obenberger, J.** 1924. Symbolae ad specierum regionis Palaearcticae Buprestidarum cognitionem. Jubilejní Sborník československé Společnosti Entomologické, 1924: 6-59.
- Obenberger, J.** 1935. Nový krásek z Buchary (Col. Bupr.). [New Buprestid beetle from Bukhara]. Acta Societatis Entomologicae Cechosloveniae, 32: 207.
- Obenberger, J.** 1938. Studie o družích rodu Anthaxia Eschsch. (Col. Bupr.). Etudes sur les espèces du genre Anthaxia Eschsch. (Col. Bupr.). Acta Entomologica Musei Nationalis Pragae 1 B, Number II (Zool., Number, 4): 171-249.
- Reitter, E.** 1890. Uebersicht der mir bekannten Arten der Coleopteren, Gattung Acmaeodera Eschsch. aus Europa und den angrenzenden Ländern. Entomologische Nachrichten, 16 (22): 335-347.
- Rey, C.** 1891. Remarques en passant. Buprestides (Suite). L'Échange, Revue Linnéenne, 7 (73): 4-5.
- Sakalian, V. P.** 2003. A catalogue of the jewel beetles of Bulgaria (Coleoptera: Buprestidae). Zoocartographia Balcanica No. 2, Pensoft Series Faunistica No 30, 246 pp.
- Semenov-Tian-Shanskij, A.** 1891. Diagnoses Coleopterorum novorum ex Asia Centrali et Orientali. III. Trudy Russkago Ėntomologičeskogo obščhestva, 25 (1890-1891): 262-382.
- Semenov-Tian-Shanskij, A.** 1895a. Coleoptera Asiatica nova. III. Trudy Russkago Ėntomologičeskogo obščhestva, 29: 125-144.
- Semenov-Tian-Shanskij, A.** 1895b. Coleoptera nova Rossiae Europaeae Caucasicae. Trudy Russkago Ėntomologičeskogo obščhestva 29: 242-250, 303-327.

- Slocombe, D. S.** 1993. Implementing ecosystem-based management. *BioScience*, 43: 612-622.
- Stepanov, V. N.** 1954. Novye dlya fauny SSSR vidy zlatok s fistashki (*Pistacia vera* L.) iz Turkmenii (Coleoptera, Buprestidae). [Species of Coleoptera, Buprestidae, new to the fauna of the USSR found on *Pistacia vera* L. from Turkmenistan]. *Zoologicheskii Zhurnal*, 33(6): 1307-1311. [in Russian]
- Stepanov, V. N.** 1958. Materialy k faune zlatok Tadzhikistana i sopredel'nykh raionov Srednei Azii (Coleoptera, Buprestidae) (Soobshcheniye I). [Materials to the buprestid-fauna of Tadzhikistan and adjacent regions of the Middle Asia (Coleoptera, Buprestidae) (1st Report)]. In: S. M. Ablayev. (Ed.). *Sbornik, posvyashchennyi pamyati B. V. Lototskogo. Trudy Instituta zoologii i parazitologii Akademii Nauk Tadzhikskoi SSR*, 89: 111-121. [in Russian with Tadjic summary]
- Théry, A.** 1895. Descriptions de quelques Buprestides nouveaux (Col.). *Bulletin des Séances et Bulletin Bibliographique de la Société entomologique de France*, 64: clvii-clix.
- Volkovitsh, M. G.** 2006. New nomenclatorial and taxonomic acts, and comments. Buprestidae: Polycestinae and Buprestinae. pp. 56-8; Catalogue. Buprestidae: Polycestinae. pp. 330-342. In: I. Löbl & A. Smetana (Eds): *Catalogue of Palaearctic Coleoptera. Volume 3. Scarabaeoidea - Scirtoidea - Dascilloidea - Buprestoidea - Byrrhoidea*. Apollo Books, Stenstrup, 690 pp.
- Volkovitsh, M. G. & Kalashian, M. Y.** 2006. New nomenclatorial and taxonomic acts, and comments. Buprestidae: Chrysochroinae: Sphenopterini. pp. 53-56; Catalogue. Buprestidae: Chrysochroinae: Sphenopterini. pp. 352-369. In: I. Löbl & A. Smetana (Eds): *Catalogue of Palaearctic Coleoptera. Volume 3. Scarabaeoidea - Scirtoidea - Dascilloidea - Buprestoidea - Byrrhoidea*. Apollo Books, Stenstrup, 690 pp.
- Werner, R. A.** 1996. Forest health in boreal ecosystems of Alaska. *For. Chron.*, 72: 43-46.